

Application No. 10/697,647
Amendment under 37 C.F.R. §1.111 dated January 19, 2005
Response to the Office Action of October 19, 2004

Amendments to the Claims

Listing of claims:

This listing of claims replaces all prior versions and listings of claims in the application.

Claim 1 (Currently Amended): An electron beam apparatus comprising [[:]] :

an electron gun for directing a plurality of primary electron beams onto a sample [[:]] :

~~an accelerator for accelerating~~ objective lens for forming an electric field to accelerate a
plurality of secondary electron beams emitted from said sample;

a separator for separating said [[:a]] plurality of secondary electron beams from a primary
optical system [[:]] and ~~a director~~ for directing said plurality of secondary electron beams into a
secondary optical system for guiding to a detector outputting a detection signal of the secondary
electron beams; and

~~a plate having a plurality of apertures corresponding to said plurality of secondary
electron beams in front of said detector.~~

a deflector for deflecting said secondary electron beams in said secondary optical system,
wherein said deflector is controlled to deflect said plurality of secondary electron beams
synchronously with scanning of said plurality of primary electron beams, thereby preventing said
plurality of secondary electron beams from moving on said detector in response to the scanning
of said plurality of primary electron beams.

Claim 2 (Currently Amended): An electron beam apparatus according to claim 1, wherein
said plurality of primary electron beams and said plurality of secondary electron beams are

Application No. 10/697,647

Amendment under 37 C.F.R. §1.111 dated January 19, 2005

Response to the Office Action of October 19, 2004

~~arranged in the vicinity of an optical axis, and said plurality of apertures are formed in the shape of an ellipse which is longer in a radial direction, an X-axis direction of XY-coordinates, and/or a Y-axis direction of the XY-coordinates from the optical axis in a plane orthogonal to the optical axis.~~

Claim 3 (Currently Amended): An electron beam apparatus according to claim 1, further comprising:

a number of memories twice as much as ~~[[the]]~~ a number of said detectors for storing digital signals generated by A/D converting the detection signals ~~[[,]]~~ ; and

change-over switches disposed in front of and at ~~[[the]]~~ a back of said memories, wherein the detection signals from said detectors are input in one of said memories while the previous detection signals stored in another of said memories are transmitted into a CPU or an image processing unit.

Claim 4 (Currently Amended): An electron beam apparatus according to claim 1, further comprising a ~~deflector for deflecting said secondary electron beams in said secondary optical system, wherein said deflector is controlled to deflect said plurality of secondary electron beams asynchronously with scanning of said plurality of primary electron beams, thereby preventing said plurality of secondary electron beams from moving on said second aperture plate in response to the scanning of said plurality of primary electron beams~~ a plate having a plurality of apertures corresponding to said plurality of secondary electron beams in front of said detector.

Claim 5 (Currently Amended): An electron beam apparatus comprising [[:]] :

an electron gun having a cathode ~~member~~ electrode, a Wehnelt ~~member~~ electrode, and an anode ~~member~~ electrode [[:]] :

wherein ~~a portion of~~ said Wehnelt ~~member~~ electrode comprises a first portion adjacent to said cathode ~~member~~ electrode and a second portion ~~can be~~ separated from the rest of said ~~Wehnelt member~~, said first portion, said first portion being and can be finely moved moveable in an x-direction, a y-direction, or a z-direction orthogonal to one another.

Claim 6 (Currently Amended): An electron beam apparatus according to claim 5,

~~comprising an~~ wherein said electron gun ~~which has~~ comprises a multi-emitter machined as a cathode including a plurality of emitters integrated thereon, a heater for heating said multi-emitter, a ~~supporter~~ supporter for fixing said multi-emitter and said heater at given positions, a Wehnelt electrode, and a fine adjustment mechanism for finely adjusting the position of a portion of said Wehnelt electrode which is adjacent to said multi-emitter,

wherein [[:]] said fine adjustment mechanism is configured to be able to finely adjust the position of said portion of said Wehnelt electrode in at least one of an x-direction, a y-direction, and a θ -direction in a plane parallel to a plane which includes said multi-emitter, and a tilt direction in a plane perpendicular to said plane.

Application No. 10/697,647
Amendment under 37 C.F.R. §1.111 dated January 19, 2005
Response to the Office Action of October 19, 2004

Claim 7 (Original): An electron beam apparatus according to claim 6, wherein said fine adjustment mechanism in the θ -direction or tilt direction is disposed at a z-position substantially identical to said emitter.

Claim 8 (Original): An electron beam apparatus according to claim 6, wherein said portion of said Wehnelt electrode has a plurality of small holes corresponding to said plurality of emitters, and has a thickness of 200 μm or less only in the vicinity of said holes.

Claim 9 (Currently Amended): An electron beam apparatus according to claim 5, wherein said electron beam apparatus forms a plurality of narrowed electron beams from emissions of said electron gun, scans a sample surface with said electron beams [[,]] and detects secondary electron beams formed of secondary electrons emitted from scanned positions on said sample surface using a plurality of detectors.

Claim 10 (Currently Amended): ~~A device manufacturing method characterized by evaluating a wafer after the end of each wafer process for at least one wafer process using an electron beam apparatus according to claim 1~~ An electron beam apparatus, comprising:

an electron gun for directing a plurality of primary electron beams onto a sample;

an objective lens for forming an electric field to accelerate a plurality of secondary electron beams emitted from said sample;

Application No. 10/697,647
Amendment under 37 C.F.R. §1.111 dated January 19, 2005
Response to the Office Action of October 19, 2004

a separator for separating said plurality of secondary electron beams from a primary optical system; [[and]]

a director for directing said plurality of secondary electron beams into a secondary optical system for guiding to a detector outputting a detection signal of the secondary electron beams;
and

an ExB separator disposed between the objective lens and former stage lens in the primary optical system for separating said secondary electron beams.

Claim 11 (Currently Amended): An electron beam apparatus for directing a plurality of primary electron beams onto a sample, comprising [[:]] :

~~an electron gun for directing a plurality of primary electron beams onto a sample, an accelerator for~~ objective lens for forming an electric field to accelerating accelerate a plurality of secondary electron beams emitted from said sample;

a separator for separating said [[a]] plurality of secondary electron beams from a primary optical system; and

a director for directing said plurality of secondary electron beams into a secondary optical system for guiding to a detector outputting a detection signal of the secondary electron beams[[; and]]

wherein an ExB separator deposited between the objective lens and the former stage lens in the primary optical system for separating said a secondary electron image is focused around said separator.

Claim 12 (Currently Amended): An electron beam apparatus for directing a plurality of primary electron beams onto a sample, comprising:

an accelerator for accelerating a plurality of secondary electron beams emitted from said sample;

a separator for separating said secondary electron beams from a primary optical system; and

a director for directing said plurality of secondary electron beams into a secondary optical system for guiding to a detector outputting a detection signal of the secondary electron beams;

wherein a secondary electron image is ~~focussed~~ focused around the separator.